BARRACKPORE RASTRAGURU SURENDRANATH COLLEGE

SYLLABUS FOR M.Sc. IN GEOGRAPHY

(TO BE EFFECTED FROM THE ACADEMIC SESSION 2018-2019)

SEMESTER-I

Paper - 1.1: Geomorphology

5 credit course: 75-90 class of 45 minutes duration

Unit 1: Fundamentals of Geomorphology

1.1 Approaches to Geomorphology: Structural, Climatic, Applied and System approach.

1.2 Some basic concepts: a) spatial and temporal scales in Geomorphology, b) feedback mechanisms, c) concept of magnitude and frequency, d) concept of equilibrium and evolution and e) concept of threshold.

1.3 Principles of relative and absolute dating: Geological timescale, geochronological methods – documentary evidence, artifacts, major horizons, radiometric, dendrochronology, thermo luminescence.

Unit 2: Study of Geographical Processes and Forms

2.1 Slope processes and forms: Properties and behaviour of slope material, mass movement processes and slope stability, water erosion and solute transport on slopes, theories of slope development.

2.2 Drainage basin as a geomorphic unit: Linear, aerial and relief properties; channel forms and drainage patterns.

2.3 Evolution of coastal landforms in rocky, sandy and deltaic coasts.

2.4 The Periglacial environment: processes and landforms.

Unit 3: Applied Geomorphology

3.1 Application of Geomorphological knowledge in management ofDams, Barrages, Embankments, Ports and Urban drainage system.

3.2 Geomorphic approach to hazard and disaster studies and their management: Landslides and River bank erosion with special reference to West Bengal.

Paper 1. 2 : Hydrology and Oceanography

5 credit course: 75-90 class of 45 minutes duration

Unit1 :Hydrology

1.1 Emergence, Scope and Content of Hydrology; Global Hydrological Cycle and System approach

1.2 Global water balance.

1.3 Run off and Concept of Run off Cycle.

1.4 Hydrological Parameters: Instrumentation and measurement (Velocity, Discharge, Precipitation, Evaporation, Transpiration).

1.5 Concept and application of Hydrograph and Unit Hydrographs.

1.6 Ground Water Storage, movement (application of Darcy's law), Characteristics and Classification of ground water; Problems related to withdrawal of Ground water.

1.7 Problems and management of Tropical Wetlands

1.8 Sustainable use of water: Rain Water Harvesting, Surface water Conservation and Recharging of Ground water.

Unit2 : Oceanography

2.1. Structural & morphological features of the ocean basins with reference to Plate tectonics:

2.2. Coral Reefs and Atoll: Origin , distribution and vulnerability

2.3. Oceanic sediments: Origin, classification and movement.

2.4. Water mass: origin, evolution, physical properties and chemical properties; Air-sea interactions.

2.5. Waves, tides and currents: components, genetic classification and models of formation

2.6. Sea-level change: types, causes and implications

2.7. Ocean as a resource: anthropogenic utilisation of the oceans; Importance of EEZ and CRZ

Paper 1.3: Geography of Resources

5 credit course: 75-90 class of 45 minutes duration

Unit 1: Concept of Resource

1.1 Nature and Natural Resources; Resource classification with reference to time-space framework, Resource Conservation and Recycling.

1.2 Concept of Resource Region and Ackerman's classification.

1.3 Technological development and resource perception; Concept of Free goods, Economic goods and Common goods, Resource trading and WTO.

1.4 Sectors of economy with reference to innovation, value addition and utilization of resources: Primary, Secondary, Tertiary, Quaternary and Quinary.

Unit2 :Study of Environmental Resources

2.1. Land and Soil Resources: classification, utilization and management, Carrying capacity of land

2.2. Water Resources: quality and quantity with reference to availability, use and sustainable development; Global water crises and conflicts,.

2.3. Mineral Resources: Metallic and Non-metallic; Mining and Environmental hazards; Mineral Policy of India.

2.4. Energy Resources: Conventional and Non-conventional; Distribution and utilization in India; Crisis and National Energy Policy.

2.5. Biotic Resources: forest, animal and fishery; problems and prospects of production, conservation and optimal utilization with particular reference to India.

2.6. Agricultural Resources: pattern of diversity (Genetic and Environmental) and problems; Green Revolution and Food Security.

Paper 1.4: Social and Cultural Geography

5 credit course: 75-90 class of 45 minutes duration

Unit 1: Social Geogrphy

1.1 Concepts of Social structure and Social space; Concept of Race, Community and Society; Social stratification; Social distance and Concept of Social segregation.

1.2 Social problems and their alleviation: Social injustice; untouchability/ apartheid, racism; Social welfare measures

1.3 Social movements and politics: Religion and Caste; Caste politics; Social Determinism

1.4 Study of Social Thoughts: Marx, Lenin, Gandhi and Tagore.

1.5 Social entities with reference to language and gender discrimination.

Unit 2: Cultural Geography

2.1. Concept of Culture, Cultural area, Cultural landscape, Concept of Cultural Diffusion and Acculturation.
2.2. Cultural ecology, Cultural politics and hegemony.
2.3. Cultural tradition of tribes and non-tribal people with special reference to West Bengal.
2.4. Information and Communication Technology and Cultural Globalization; Post-modernism and crisis of Cultural Identity.
2.5. Race, Community and Culture; Role of the Nation-State in protection and preservation of Cultural Heritage

Paper – 1.5 Practical Geography

1.1 Topographical Map: Interpretation of Physical & Cultural landscapes with the following aspects: (20)

i. Morphometric Analysis:Hypsometric Curve,Slope analysis (Raisz Henry), Dissection Index,

ii. Stream Ordering (Horton andStrahler) and Bifurcation Ratio.

iii. Analysis of spatial co-relation of settlements by NNA.

1.2 Visual Interpretation of Satellite Images: Land use and Land cover mapping. (10 marks)

1.3 Soil analysis: Determination of pH (by pH Meter), NPK (10 marks)

1.4 Water analysis: Determination of BOD and COD (10 marks)

1.6 Sound level Measurement of an Urban Area and it's mapping (5 marks)

1.6 Mapping of (15 marks)

i. Geomorphic features using conventional symbols

ii. Soil quality

iii. Ground Water Level/Quality

iv. Urban Transport/Land Use

1.7 Viva-Voce (30 marks)

Suggested References:

Module 1: Geomorphology

- Ahmed, E., 1985, Geomorphology, Kalyani Publishers, New Delhi.
- Ahmed, E., 1972, Coastal Geomorphology of India, Orient Longman.
- Chorley, R., Schumm, S. and Sugden, D.E. 1994. Geomorphology, Methuen, London.
- Cook and Doorncamp. 1988. Geomorphology in Environment Management, London
- Dayal, P., 1995, A Text Book of Geomorphology, Shukla Book Depot. Patna
- Faniran, A. and Jeje, L.K. 1983. Humid Tropical Geomorphology, Longman, London
- Fairbridge, R.W., 1968, The Encyclopaedia of Geomorphology, (Edge), Rainhold Book Corporation, New York
- Kale, V.S. and Gupta, A. 2001. Introduction to Geomorphology, Orient Longman Ltd., Hyderabad
- Knighton, D.1998 : Fluvial Forms and Processes: A New Perspective, Arnold, London
- King, L.C., 1965 Morphology of the Earth, Oliver and Boyd, Edinburgh.
- Leopold,L.B., et al, 1964, Fluvial Processes in Geomorphology, Eurasia Publishing House, New Delhi.
- Morisawa, M. (editor) 1994. Geomorphology and Natural Hazards, Elsevier, Amsterdam.
- Morisawa, M. 1985. Rivers, Longman, London.
- Melhorn, W.N. and R. C. Flemal, 1975, Theories of Landform Development, George Alen and Unwin.
- Ollier, C.D. 1981: Tectonic Geomorphology, Longman Scientific & Technical, London.
- Petts, G. and Foster, I. 1985. Rivers and Landscapes, Edward Arnold, London.
- Petts, G.E. and Amoros, C. (editors) 1996. Fluvial Hydrosystems, Chapman and Hall, London.
- Rice, R.J. 1988. Fundamentals of Geomorphology, 2nd edition, Longman Scientific and Technical, London.
- Selby, M.J. 1985. An Introduction to Geomorphology, Clarendon, Oxford.
- Starkel, L. and Basu, S. 2000 Rains, Landslides and Floods in the Darjeeling Himalaya, Indian National Science academy, New Delhi.
- Summerfield, M.A. (Editor) 1991. Global Geomorphology: An Introduction to the Study of Landforms, John Wiley and Sons Ltd., New York.
- Sing S., 2000, Geomorphology, PrayagPustakBhavan
- Thornbury, W.D. 1969. Principles of Geomorphology, Wiley Eastern Limited, New Delhi.
- Tinkler, 1985. A Short History of Geomorphology, Croom Helm Ltd., Beckenham.
- Valdiya, K.S. 1998. Dynamic Himalaya, University Press (India) Ltd., Hyderabad.
- Wooldridge, S.W., 1965, An Outline of Geomorphology, Longman

Module 2: Hydrology and Oceanography

- Brooks, K.N., Ffolliott, P.F., Gregersen, H.M and DeBano, F.B. (2003): Hydrology and the Management of Watersheds, 3rd edition, Wiley-Blackwell, Chichester.
- Brutsaert, W. (2005): Hydrology: An Introduction, Cambridge University Press, Cambridge.
- Carter, R.W.G. (1988) : Coastal Environments: An Introduction to the Physical, Ecological and Cultural Systems of Coastlines, Academic Press, London.
- Chow, V.T. (1988) : Applied Hydrology, McGraw-Hill Education, New York.
- Dingman, S.L. (2002): Physical Hydrology, 2nd edition, Prentice Hall, Englewood Cliffs.
- Ganeri, A. (1994): The Ocean Atlas, Dorling Kindersley, London.
- Garrison, T.S. (2007): Oceanography: An Invitation to Marine Science, 6th edition, Brooks Cole, Chicago.
- Keary, P. and Vine, F.J. (1996): Global Tectonics, 2nd edition, Blackwell Scientific Publications, Oxford.
- Keith, D. and Mays, L.W. (2004): Groundwater Hydrology, 3rd edition, Wiley, Chichester.

- Kinkade-Levario, H. (2007): Design for Water: Rainwater Harvesting, Stormwater Catchment, and Alternate Water Reuse, New Society Publishers, Gabriola Island (Canada).
- Pinet, P.R.(2006) Invitation to Oceanography, 4th edition, Jones & Bartlett Pub. New York.
- Pirazzoli, P.A. (1996): Sea Level Changes: The Last 20000 Years. Wiley, New York.
- Pugh, D. (2004): Changing Sea Levels. Effects of Tides, Weather and Climate, Cambridge University Press, Cambridge.
- Thruman, H.V. and Trujillo, A.P. (2003): Introductory Oceanography, 10th edition, Prentice Hall, Englewood Cliffs.
- Todd, D.K. (2004): Groundwater Hydrology, 3rd edition, Wiley, Chechester.
- Trujillo, A.P and Thurman, H,V. (2007): Essentials of Oceanography, 9th edition, Prentice Hall, Englewood Cliffs.
- Woodroffe, C.D. (2003): Coasts: Form, Process and Evolution, Cambridge University Press, Cambridge.

Module 3: Geography of Resources

- Alexander, J.W. (1963) *Economic Geography*, Prentice - hall Inc
- Boyce, Ronald Reed (1974) *The Bases of Economic Geography*, Holt, Rine Hart andWinston Inc, New York.
- Brereton, E. 1992 :*Resource Use and Management*, Cambridge University Press, Cambridge.
- Datt, R. & K.P.M. Sundaram (2006) *Indian Economy*, Prentice - hall Inc
- Elliotte, j. A. 1994 : *An Introduction to Sustainable Development*: The Developing World, Routledge, London.
- Mitchell, B. 1997 : *Resources and Environment Management*, Addison Wesley Lon~an Ltd., Harlow.
- World Bank 1996: From Plan to Market: World Development Report 1996, Oxford University Press, Oxford.
- World Resources Institute 1998: *World Resources 1998-99: A Guide to the Global Environment*, Oxford University Press, Oxford.
- Thoman& Corbin (1980) :*Geography of Economic Activity*, McGraw Hill, New York.

Module4: Social and Cultural Geography

- Basu, R. and S. Bhaduri (Ed. 2006)- Society, Development and Environment; Progressive Publishers, Kolkata
- Johnston, R. J. et al (Ed. 1994)- The Dictionary of Human Geography; Blackwell Pub. Ltd, Oxford
- Bose, N. K. (1967)- Culture and Society in India; Allied publishing House, Bombay
- MacIver, R. M. and C. H. Page (1964)- Society, Macmillan, London
- Myrdal, G. (1968)- Asian Drama; Vol. 1, Penguin Books, New York

BARRACKPORE RASTRAGURU SURENDRANATH COLLEGE

SYLLABUS FOR M.Sc IN GEOGRAPHY SEM-II

Paper -2.1 CLIMATOLOGY

UNIT-I: ATMOSPHERIC PROCESSES AND DYNAMICS

1.1 The climate system; Nature of the atmosphere and its evolution

1.2 Radiation and its distribution in the earth-atmospheric system; Spatio-temporal variation of earth's temperature and its significance

1.3 Basic forces and equations of atmospheric motion; Atmospheric turbulence: transport of heat, moisture and momentum

1.4 Adiabatic and non-adiabatic processes; Barotropic and Baroclinic instabilities; Formation and classification of clouds

1.5 General Circulation Model (GCM) with special reference to tropical circulations: Hadley and Walker; Air masses: Types, sources and modification; Tropical jet streams: Westerly and easterly jet

UNIT-II: THE MONSOON AND APPLIED CLIMATOLOGY

2.1 Synoptic features associated with onset, withdrawal and break of active and weak monsoons in India; Monsoon trough and depressions

2.2 Ocean-atmosphere coupled models in relation to the Asian Monsoon; El Nino Southern Oscillation (ENSO); Numerical Weather Prediction (NWP) of the Indian Monsoon

2.3 Origin, character and mitigation of the following Weather hazards: Heat waves and Cold waves, Thunderstorms, Dust Storms ,Western disturbances

2.4 Theories of climate change; Paleo-climatology: Content and significance; Recent global warming and its consequences: Physical, Economic, Social and Political.

2.5 Impact of climate and climate change in India with special reference to the following: Water Resources, Agriculture and food security, Morbidity and health

References:

- Journal of Current Science,Rajabazar Science College

- Aguado, E. and J.E. Burt. (2004)- Understanding Weather and Climate; 3rd Edition. Prentice Hall, Upper Saddle River, New Jersey
- Ahrens, C. D. (2003)- Meteorology Today: An Introduction to Weather, Climate, and the Environment; 7th Edition. Thomson Learning
- Barry, R.G., R.J. Chorley, and N. J. Yokoi. (2004)- Atmosphere, Weather, and Climate; 8th Edition. Routledge,
- Bryant, E. (2002)- Climate Process and Change; Cambridge University Press
- Burroughs, W. J. (2001)- Climate Change: A Multidisciplinary Approach; CUP, London Danielson, E.W., J. Levin, and E. Abrams (2003)- Meteorology; 2nd Edition. McGraw-Hill, Dubuque, Iowa
- Critchfield, H. J. (2004)- General Climatology; Prentice-Hall of India Private Ltd., New Delhi, 4th Edition
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- Drake, F. (2000)- Global Warming: The Science of Climate Change; Hodder Arnold, London Jackson, I. J. (1989)- Climate, Water and Agriculture in the Tropics; Longman, Harlow
- Hobbs, J. E. (1998)- Climates of the Southern Continents: Present, Past and Future; John Wiley and Sons Ltd., New York
- Katiyar, V. S. (1990)- The Indian Monsoon and its Frontiers; Inter India Publications, New Delhi
- Kelker, R. R. (2007)- Satellite Meteorology; B. S. Publications, Hyderabad
- Mayes, J. and K. Hughes (2004)- Understanding Weather; Hodder Arnold, London
- McGregor, R. Glenn, and S. Nieuwolt (1998)- Tropical Climatology: An Introduction to the Climates of the Low Latitudes; John Wiley and Sons Ltd., New York Moran, J.M. and M. D. Morgan (1997)- Meteorology: The Atmosphere and the Science of Weather; 5th Edition. Prentice Hall, Upper Saddle River, New Jersey
- Nagle, G. (2002)- Climate and Society; Hodder Arnold, London
- Pant, G. B. and K. Rupa Kumar (1997)- Climates of South Asia; John Wiley and Sons Ltd., New York
- Pandharinath, N. (2006)- A Course in Dynamic Meteorology; B. S. Publications, Hyderabad
- Pandharinath, N. (2007)-The Science of Weather and Environment; B. S. Publications, HyderabadSolomon, S. etc. (2007)- Climate Change 2007: The Physical Science Basis; Cambridge University Press
- Ramage, C. S. (1971)- Monsoon Meteorology; Academic Press; New York and London
- Robinson, P. J. and A. Henderson-Sellers (1999)- Contemporary Climatology; Prentice-Hall of India Private Ltd., New Delhi, 2nd Edition
- Ruddiman, W.F. (2000)- Earth's Climate: Past and Future; W. H. Freeman and Co.
- Thompson, R. D. and A. Perry (Ed.1997)- Applied Climatology; Routledge, London and New York
- Trewartha, G. T. (1981)- The Earth's Problem Climates; University of Wisconsin Press, 2nd Edition

Paper -2.2 (Soil and Bio-Geography)

UNIT -I (SOIL &BIO-GEOGRAPHY)

1.1 Meaning and Scope of Pedology, Edaphology and Soil Geography; Soil as a dynamic substance; Concept, Nomenclature and Usefulness of soil profile; Concept of Pedon and Polypedon.

1.2 Concept of soil environment: Soil temperature, Soil humidity, Soil aeration and Soil organisms.

1.3 Soil formation in Humid Tropics with reference to Laterisation, Gleisation and Peat formation.

1.4 Physical properties of soils: Colour, Texture, Structure, Pore space, Density, Cohesiveness, Mechanical strength, Compaction and their inter-relations.

1.5 Chemical properties of soils: Soil acidity soil alkalinity; Soil pH and its significance; Soil organic matter: Decomposition and Humification with reference to Clay-Humus complex and C: N ratio.

1.6 Soil Classification: FAO; Soil and Land Classification of India.

1.7 Soil degradation:Hazards related to Erosion and Pollution; Soil Management: Fertility, Amelioration and Conservation.

UNIL - II (BIO-GEOGRAPHY)

2.1 Scope and content of Biogeography; Concept and Significance of Biodiversity; Dispersal and Concentration of animals; Theories regarding distribution of plants and animals.

2.2 Ecology and Ecosystem: difference in meaning and significance; Types of Ecology: Habitat approach: Fresh water, Marine, Estuarine and Terrestrial.

2.3 Biomes: Concept and Classification; Characteristics of Broad-leaved Evergreen Subtropical forest, Tropical Savanna, Tropical Scrub, Himalayan forest biomes, their degradation and problems of extinction.

2.4 Human Ecology: Deforestation, Urbanization and loss of biodiversity; Endangered species in India (20 species of flora and fauna being at least 10 from each group)

2.5 Policies and Programmed for Conservation of Biota; Concept of Spaceship Earth; Social Ecology and Gaia theory.

Paper -2.3 (Philosophy of Geography)

UNIT -I Foundations and Development of Geography

1.1 Schools of Geographical Thought: German, French, American, British and Indian.
1.2 Nomosthetic and Idiographic nature of Geography: Hartshorne and Schaefer Debate.
1.3 Quantitative Revolution in Geography
1.4 Radical Geography
1.5 Modernism and Post Modernism in Geography.

UNIT -II Explanation in Geography

2.1 Explanation in Geography : Cognitive description, cause and effect Analysis, Temporal models of explanation : Functional and Ecological analysis and models
2.2 Theories in Geography.

UNIT - III Contemporary Focus in Geography

3.1Geography of Crime and Social discrimination.
3.2 Geography of Gender.

3.3 Welfare Geography.

Paper – 2.4 *(*Population and Settlement Geography)

POPULATION GEOGRAPHY

Unit I: Population: Dynamics and Welfare

1.1 Nature, scope, subject matter and trends of Population Geography and its relation with Demography.

1.2 IMR, MMR with reference to India.

1.3 Migration Theories and measurement.

1.4 Quality of life: Parameters of Social Wellbeing.

1.5 Population policies in India: Critical appraisal.

1.6 Population related Millennium Development Goals.

SETTLEMENT GEOGRAPHY

Unit-II (Rural Settlement)

2.1 Concept of settlement: Rural and Urban settlement (census definition and categories), evolution and growth of rural settlement in India.

2.2 Concept of rural service centres and rural hierarchy, distribution, dispersion and segregation of rural settlement, rural house forms and types in different environmental conditions in India.

Unit – III (Urban Settlement)

3.1 Definition of urban centres: World and India, characteristics of urban settlement (metropolitan, conurbation, megacity, megalopolis, city, town).

3.2 Morphology of towns: classical and non-classical models, concept of urban re-development, urban renewal and new town.

3.3 Theories of spacing of urban settlement, urban hierarchy, concept of umland and rural- urban continuum.

3.4 Urban housing, policies, problems with special reference to slums and unauthorized shanties, concept of outgrowth and urban sprawl.

References (Population geography)

Agarwala,S.N India's Population Problem,McGraw Hill, New Delhi. 1977

Banerjee D. Family Planning in India: A Critic and a Perspective. Peoples Publishing House, New Delhi 1971.

Beaujeu-Garnier Geography of Population, Longman, London. 1976

Bose, Ashish (ed) Patterns of Population Change in India 1951-61, Allied Publishers, New Delhi, 1967

Bose Ashish, Meeting India's Best Needs: Human Development Index Delhi 1996.
Bhattacharjee PJ and Shastri GN, Population in India, Vikash Publishing House 1976
Chandna RC, Geography of Population, Concepts, Determinants and Patterns. Kalyani Publishers Fifth Edition 2003.
Clarke, John I. Population Geography, Pergamon Press, Oxford. 1972
Demko, G.et al Population Geography: A Reader, McGraw-Hill company,New York, 1970
Jones,H.R A Population Geography, Harper and Row Publishers 1981
Mukherjee R.K, Family and Planning in India, Orient Longman, Calcutta 1976
Trewartha,G.T A Geography of Population:World Patterns, JohnWilley and Sons,
New York. 1969
Woods, R. Population Analysis in Geography, Longman, London. 1979
Zelinsky,W. A Prologue to Population Geography, Prentice Hall Inc,N.J. 1966

References (settlement geography)

1. Hopkinson. D. (1983): Geography of settlement, Oliver and Boyd.
2. Hudson, F.S. (1970): Geography of settlements, Machoeld and Evans Ltd.
3. Mandal, R.B.: Introduction to rural settlement (revised and enlarged editio
4. Ghosh, S.: Introduction to settlement geography
5. Long, G.C. & Morgan, G.C.: Human and Economic Geography.
6. Sing, R. Y.: Rural Settlement.

Paper **-2.5 (Practical)**

UNIT -1 (SURVEYING) **(30marks)**

1.1 Determination of height of an object by Theodolite (Oblique Plane Method)

1.2 Plotting of Land features by Tacheometric Survey/Plane-Table Survey

1.3 Traversing and Plotting by Global Positioning System (Closed/open Traverse)

UNIT-2 (MAP PROJECTION) **(30marks)**

2.1 Classification of Map Projection, concept of Oblate Spheroid and Trigonometry of Spherical Triangle

2.2 Drawing of Graticule with maps on Azimuthal Gnomonic and Stereographic projections (Equatorial case), Interrupted Sinusoidal Projection, Universal Transverse Mercator Projection

UNIT -3 FIELD WORK AND REPORT **(40marks)**

The students should prepare a field report in groups (of not less than 5 and not more than 10 students in each group) under the supervision of the concerned teacher(s). They will conduct field study for collection of

primary data supported by secondary data for correlating physical and cultural features. The field work should be area and topic specific, and the report should consist of not more than thirty pages of A4 (220 X 270mm) size including about ten maps/ diagrams/ photographs. The matter should be neatly typed with 1.5 spacing duly certified by the supervisor(s) concerned. A board of examiners comprising of both internal and external will assess the students, on the basis of the field report and group discussion.

BARRACKPORE RASTRAGURU SURENDRANATH COLLEGE

SYLLABUS FOR M.Sc IN GEOGRAPHY SEM-III

Paper-3.1 : REGIONAL GEOGRAPHY OF SOUTH ASIA

5 credit course: 75-90 class of 45 minutes duration

1.Geographical Identity of South Asia:

1.1 Physical significance

1.3 Cultural significance

Economic significance

1.4 Political significance

2. Post colonial economic growth:

2.1 Economic situations at the end of colonial rule

2.2 Impact and extent of privatization

2.3 Impact and extent of globalization

2.4 Impact and extent of liberalization

3. Regional conflict and cooperation

3.1 Conflicting areas and issues

3.2 Pattern of conflict

3.3 Emergence of the concept of regional cooperation

3.4 Experience of cooperation with neighbouring regional blocks

4. Role of SAARC

4.1 Historical evolutions

4.2 Principles and objectives

4.3 SAARC summits and achievements

4.4 Present status, shortcomings and future prospects

5. Constraints for development of the region:

5.1 Bilateral issues

5.2 Political dynamics (regional and global)

5.3 Social and ethnic problems

Paper -3.2 WEST BENGAL WITH SPECIALREFERENCE TO GANGA DELTA

1. Physical background of West Bengal

1.1Geomorphological units and their characteristics

1.2 Climatic elements with special reference to cyclones
1.3 Hydro-morphological characteristics of rivers
1.4 Ground water: distribution and characteristics

2. Socio-economic background of West Bengal

2.1 Population Dynamics: Growth, Migration and Changing Population Composition
2.2 Technological Innovation, land reform and changing rural economy
2.3 Problems of industrialization and changing industrial scenario
2.4 Infrastructural development and urbanisation

3. Problems and prospects of West Bengal

3.1 Hazards and Disasters: Adjustment and Mitigation with special reference to landslides, flood and river-bank erosion
3.2Decay of Rivers and Its Effect on the Port- Industrial Economy
3.3 Ground Water Contamination and Its Impact
3.4 Human Development

4. Geomorphology of the Ganga Delta

4.1 Delineation and classification of landforms
4.2 Geomorphic problems of upper Ganga Delta: river-bank erosion and channel degeneration
4.3 Geomorphic problems of lower Ganga Delta: tidal characteristics, coastal erosion and estuarine sedimentation
4.4 Sea level change: characteristics and impacts

5. Cultural environment of Ganga Delta

5.1 Growth and distribution of population, migration and effects of partition
5.2 Land use and its planning: cropping pattern and irrigation, land capability and agriculture
5.3 Resources and their utilization: characteristics and distribution of surface and sub surface water and water crisis
5.4 Industrial scenarios: tourism and jute textile, problems and prospects

Paper -3.3 (POLITICAL GEOGRAPHY & GEOGRAPHYOF DEVELOPMENT)

A.POLITICAL GEOGRAPHY

1. APPROACHES OF POLITICAL GEOGRAPHY

1.1Whittlesey'sLaw Landscape Approach
1.1 Hartshorne's Functional Approach
1.2 Political Systems Model

2. CONCEPT OF NATION AND STATE

2.1 Concept of State, Nation, Nation-State
2.2 India- Location , Size, Shape, Territorial Sea

B.GEOGRAPHY OF DEVELOPMENT

1. CONCEPTUAL BACKGROUND

1.1 Concept of Development and Under Development
1.2 Debate on Development, Club of Rome and Limits To Growth, Classical Theory by Adam Smith, Modern Theories By Lewis and Capacity Approach By AmartyaSen

2. FORMS OF DEVELOPMENT

2.1 Economic Development: Impact of Globalisation and Liberalisation on Development, Employment Challenges in Developing Nation

2.2 Inclusive Development and Economic Reforms in India

2.3 Social Development: Inequalities in Health and Education, Gender Inequality and Inequality Trap forWomen, Community Participation and Property Rights

Paper –3.4 (ENVIRONMENTAL ISSUES IN GEOGRAPHY)

1. CONCEPT OF ENVIRONMENT

1.1 Environmental Geography: Approaches and Recent Trends, Concept of Monistic and Holistic Environment

1.2 Socio Cultural Aspects of Environment with Special reference to Demographic Characteristics, Housing and Sanitation, Availability of Safe Water, Health, Hygiene and Nutrition

2. ENVIRONMENTAL DEGRADATION : FORMS AND PROCESSES

2.1 Perception, Vulnerability, Risk, Social Response and Management Practices

2.2 Social Hazards: Atrocities against Children and Women, Old age Problems, Ethno-Cultural Marginalisation

2.3 Impact of Modern Agriculture, Industrialisation and Urbanisation on the Quality of Soil, Water and Air

3.ENVIRONMENTAL MANAGEMENT

3.1 Global Resource Crisis and Different Management Strategy: Energy and water Security

3.2 Major Earth Summits: Stockholm, Rio-de-Jeneiro, Johannesburg

3.2 E.I.A. and E.M.P.

3.3 Environmental Issues Related to Wetland Conservation Wasteland management India

3.4 Environmental Awareness and Movements in India ,The Role of NGOs

Paper –3.5 PRACTICAL GEOGRAPHY

1. QUANTITATIVE TECHNIQUES (35 marks)

Nature and types of geographical data

Sampling-Methods of sampling, sampling techniques: Purposive, Random, Systematic, Stratified and Multistage

- Hypothesis testing- Test of significance: Decision Error of 1st and 2ndkind , Chi- Square Test.
- Regression Analysis: Linear(including Residual Mapping) and Exponential.

Probability-concept and application

Random Variable and Probability Distribution(one dimensional)

Uniform distribution, Binominal and Poisson's Distribution.

Spearman's Rank Correlation Coefficient

- Lorenz Curve and Determination of Gini Coefficient.
- Index Number: Determination of Cost of Living Index.
- Spatial Analysis: Determination and Location of Mean Centre, Calculation of Standard Distance

2. COMPUTER APPLICATION IN GEOGRAPHY (10 marks)

Work on Microsoft Excel- Data entry, Tabulation and analysis (sum, average, median, and mode) Graphical representation of data Scatter Diagram with Trend Line, Time series with Trend Line and Histogram.

3. Remote Sensing and GEOGRAPHICAL INFORMATION SYSTEM (25 MARKS)

3.1.**Geographical Information System – Theory** -
Some Basic Concepts, Definition, Data Structure in GIS, Spatial Data, Attribute Data, Types of Spatial data (Raster, Vector, Real World Image), Types of Vector Data (Point, Line Polygon), Layer Concept, Areas of application.

3.2**. Geographical Information System – Practica**l -

Georeferencing, Digitisation (Polyregion creation, editing and correction of errors), Measurement of Areas, Attachment of Attribute Data,.

3.3**.Digital Image Analysis**:

Image Registration and rectification, Band combination techniques (FCC),Images subset and Image Enhancement techniques, Methods of Image classification (Supervised Classification accuracy assessment & class editing),NDVI , Change detection.

4. Viva - voce (30 marks)

BARRACKPORE RASTRAGURU SURENDRANATH COLLEGE

SYLLABUS FOR M.Sc IN GEOGRAPHY SEM-IV

Paper – 4.1

Special Paper (Optional) – Theoretical

Paper: 4.1A Environmental Geography - I

Unit I: Concept

1.1 Scope, Content and Recent Dimensions of Environmental studies in Geography

1.2 Symbiosis between Man and Environment; Effects of Environment on man: Bio-physical, Perceptional, Behavioral and that related to Resource Availability

1.3 Effects of Man on Environment with changes in Mode of Production

1.4 Physical, Ecological and Human Ecological Issues, Holistic and Reductionist Approaches to Environment

Unit II: Atmospheric Changes and the Biosphere

2.1 Climatic Factors shaping the Geographical, Zoning and its Periodicity

2.2 Changing Climate of the World

2.3 Climatic Hazards and Management, Social Response to Climatic Hazard

2.4 Biomes and their relationships to Climate and Hydrological Cycle

Unit III: Environmental Degradation and Hazards

3.1 Water, Air and Noise problems in urban-industrial Environment; Water and soil pollution in rural landscape

3.2 Impact of Green Revolution; Problems of Solid waste and nuclear fallout

3.3 Human response to Flood, Drought, Landslide, Earthquake and Cyclone

3.4 Disaster Management

Paper: 4.1. B. POPULATION GEOGRAPHY

Unit I : Basics of Population Studies

1.1 Concept and scope of Demography
1.2 Relation between Demography and other Social Sciences
1.3 Emergence and development of Population Geography
1.4 Sources of population data: Census, vital registration and sample survey

Unit II : Theories and Models of Population Studies

2.1 Malthusian Theory and Neo-Malthusianism
2.2 Social and Economic Theories :Marxian View of Surplus Population, Dumont,Leibenstein
2.3 Optimum Theory of Population: Carr Saunders and its criticism
2.4 Logistic Curve Theory by Pearl and Reeds, Mobility Transition Theory (MTT)

Unit III : Population Dynamics

3.1 Fertility: Concept of Cohort Fertility, Theories of Fertility- Bongaart's Proximate Determinants of Fertility, Davis and Blake's Intermediate Variable Framework; Factors of differential Fertility

3.2 Mortality: Concept of Morbidity and Life Expectancy, Significance of Maternal Mortality and Infant Mortality in Population Dynamics

3.3 Migration: Trends and significance of International Migration, Stouffer's Theory of Intervening Opportunities and Competing Migrants, Harris-Todaro Model of Migration, , Concept of Environmental Refugees

Paper: 4.1.C. FLUVIAL GEOMORPHOLOGY

Unit I : Drainage Basin Characteristics

1.1 Scope, concept of fluvial geomorphology
1.2 Drainage basin as a unit of study
1.3 Characteristics and aerial properties of drainage basin
1.4 Network evolution and Channel initiation
1.5 Hill slope processes and catchment denudation

Unit II : Fluvial Processes

2.1 Stream hydraulics (Geometric properties of Channel
2.2 Erosional processes – mechanics of erosion, thresholds of erosion, Channel development, valley shape and associated landforms
2.3 Sediment entrainment and transport – dissolved load, suspended load, bedload.
2.4 Flow regimes (laminar, turbulent), critical tractive force, critical erosion velocity.
2.5 Depositional processes – factors causing loss of transporting ability, laws of sediment deposition/ settling velocity, associated landforms

Unit III : Adjustment of Channel form

3.1 Characteristics of adjustment
3.2 Cross sectional form
3.3 Channel pattern: straight/sinuous /meandering/braided
3.4 Channel gradient and longitudinal profile

Paper – 4.2

Special Paper (Optional) – Theoretical

Syllabus for Special Paper: Environmental Geography
Paper: 4.2A Environmental Geography - II

Unit I: Anthropogenic Impacts

1.1 Agricultural and Industrial Planning and Environment

1.2 Man-animal Conflict in Forest-society Interface of Sundarbans

1.3 Human Impact of River Valley Planning

1.4 Urban Environmental Management: Local Self-governance and Community Action; Significance of Slum Development and Ecotourism

Unit II: Environmental Management

2.1 Global Resource Scarcity and Use of Oceans as International Commons.

2.2 Sustainable Development: Concepts and Models

2.3 Environmental Impact Assessment: Concepts and Indian Case Studies; Recommendations of Rio+20 Conference; Environmental Audit

2.4 Environmental Management: Case Studies of East Calcutta Wetland and Chilika; Environmental Management Plan

UNIT III: Environmental Policy and Management in India

3.1 Environmental Perception, Ethics, Laws and Policies

3.2 Environmental Movements in India*: Bisnoi, Chipko*, Silent valley and Narmada

3.3 Participatory Management of forests in India with special reference to West Bengal

3.4 Legal Intervention, Government Policy, Institutional set-up and Role of NGOs in Environmental Management in India, Bhopal Gas Tragedy and Ganga Action Plan

4.2. B. POPULATION GEOGRAPHY

Unit I : Growth and Structure of Population

1.1 World Growth of Population

1.2 Trend of Population Growth in India

1.3 Concept of Population Composition: Biological, Economic and Social

1.4 Population Composition in India: Spatial and Temporal Dimensions

Unit II : Socio-economic Development and Population in India

2.1 Enrolment Rate, School drop-outs and Child labour Problem

2.2 Problems of Disadvantaged Population: Women, Children and Ageing population and Physically Challenged population

2.3 Problems of Marginalized Population: Tribes and Internally Displaced Persons

2.4 Problems of Urban Population: Poverty, Unemployment and Quality of Life

Unit III : Population Policies and Projection

3.1 Population Policies and Programmes in India

3.2 Concepts and Techniques of population projection

4.2.C. FLUVIAL GEOMORPHOLOGY

Unit I : Channel changes through time

1.1 Evidences and causes of change : long and short term changes

1.2 Tectonic effect and fluvial response

1.3 Climatic effect and fluvial response

1.4 Effect of flood and fluvial response

1.5 Human interference and fluvial response

Unit II : Case studies of selected river valleys from India with special reference to structure, process, forms, hazards and their management

2.1 The Tista Valley

2.2 The Kosi Valley

2.3 The Narmada Valley

2.4 The Subarnarekha Valley

Unit III: Techniques for integrated watershed management

3.1 Concept and significance of watershed based development
3.2 Watershed resource appraisal – physical and cultural
3.3 Soil and water conservation – rain water harvesting and check dams
3.4 Role of Environmental Impact Assessment (EIA) in watershed management
3.5 Data required for watershed management : Lithology, Climate, Hydrology (surface and ground water use and quality) , sea level fluctuation, Soil, Vegetation, Land use-landcover;
3.6 Use of tools for watershed mapping : Maps, aerial photographs, satellite images, GPS.

Paper – 4.3 RESEARCH METHODOLOGY (Marks: 50)

Unit-I-Research Concepts

1.1 Objectives of research

1.2 Steps of research

1.3 Quantitative & Qualitative approaches

1.4 Research Problem

1.5 Research Design

1.6. Levels of Measurement

1.7 Writing Training: Writing a research proposal, report writing and Reference writing

Unit-ll- Methods of data Collection

2.1 Primary data- census and sampling methods, sampling size and sample frames, schedule and questionnaires

2.2 Secondary data-an appraisal of some basic secondary sources of socio-economic and demographic data with particular reference to India.

Unit -Ill- Data Analvsis

3.1 Data classification
3.2 Standardization of data- Rank and Z-scores
3.3 Composite index
3.4 Construction and Testing of Hypotheses: a.Parametric: Pearson's Product moment Correlation coefficient, regression analysis (bivariate),Concept of Partial and multiple Correlation
b. Non-Parametric:, Chi-Square, concept of variance and covariance

Paper – 4.4

Special Paper (Optional) –Practical (50 Marks)

Syllabus for Special Paper: Environmental Geography
Paper: 4.4A Environmental Geography - III

Unit I: Laboratory Techniques to Detect Environmental Pollution

1.1 Acidity and Alkalinity of Soil and Water
1.2 Nitrate and Phosphate content in Water
1.3 Total hardness in Water
1.4 Dust fall and Measurements of Air-pollutants

Unit II: Environmental Survey and Mapping Techniques

2.1 Sampling Procedures
2.2 Preparation of Questionnaire for Perception Survey on Environmental Problems (Natural and Social Hazards)
2.3 Environmental Mapping Techniques, Population—Development—Environment interrelationship
2.4 Preparation and Interpretation of Environmental Maps in Micro-level

Unit III: Field Techniques

3.1 Identification and study of an Environmental Problem in field and preparation of the Structure of an EIA
3.2 Regression Analysis, Correlation and (bi-variate) Time Series Analysis of Environmental data, Concentration by Lorenz Curve
3.3 Cartographic presentation of Primary/Secondary data and collation of Environmental Maps

4.4b. Population Geography

1.1 Measures of Growth Rates: Decadal growth rate, arithmetic, geometric growth rate, exponential growth rate.
1.3 Fertility measurements: ASFR, TFR, SFR, Vital Index of Population, GRR,NRR
1.3 Mortality measurements: ASDR, SDR, IMR, MMR.

1.4 Measures of population composition: Age-sex Pyramid, Sex-ratio and Dependency Ratio, Work Participation rate.

1.4 Measures of Poverty: Head Count Ratio

1.6 Population Potential, Location Quotient

1.7 Population Projection

Application of software in Population Data Analysis

4.4c.Fluvial Geomorphology Practical

(i) Morphometric analysis

Ruggedness number of drainage basin, Constant of Channel Maintenance , Hypsometric Curve, Hypsometric Integral

(ii) Application of SRTM data / LISS image for drainage basin delineation

(iii) Field survey techniques – cross profile, wetted perimeter, hydraulic radius, velocity measurement by current meter,

(iv) Geomorphic mapping: Identification of geomorphic features based on satellite maps and validation of such features through field survey.

(v) Sediment analysis-Suspended sediment concentration, Textural analysis

Paper – 4.5

1.A. Dissertation based on Special paper (Seminar Presentation 10 marks) (50marks)

1.B. Grand Viva (50marks)